WHAT IS CLAIMED IS:

1. An electrochemical actuator comprising a high-conductivity conjugated polymer having an electrical conductivity of ≥ 100 S/cm.
2. The electrochemical actuator as described in claim 1, wherein said electrochemical actuator actuates by linear extension/contraction.
3. The electrochemical actuator as described in claim 1, wherein the high-conductivity conjugated polymer is prepared from a monomer selected from the group consisting of aniline, pyrrole, thiophene, phenylene vinylene, and derivatives thereof.
4. The electrochemical actuator as described in claim 3, wherein the derivatives comprise derivatives that generate high-conductivity conjugated polymers when polymerized.
5. The electrochemical actuator as described in claim 4, wherein the derivatives are selected from the group consisting of C1-C10 alkyl-, C1-C10 alkoxy-, halo-, nitro-, cyano-, and ester-substituted monomers.
6. The electrochemical actuator as described in claim 1, wherein the high-conductivity conjugated polymer comprises a homopolymer selected from the group consisting of polyaniline, polypyrrole, polythiophene, and polyphenylenevinylene.
7. The electrochemical actuator as described in claim 1, wherein the high-conductivity conjugated polymer comprises polyaniline processed using a sulfonic acid.
8. The electrochemical actuator as described in claim 7, wherein the sulfonic acid is selected from the group consisting of 2-acrylamido-2-methyl-1-propanesulfonic acid, camphor sulfonic acid, and di(2-ethylhexyl) phthalate-4-sulfonic acid.
9. The electrochemical actuator as described in claim 7, wherein the anion of the sulfonic acid used to process the polyaniline is exchanged for an anion soluble in a chosen organic electrolyte.

10. The electrochemical actuator as described in claim 9, wherein the anion of the sulfonic acid used to process the polyaniline is exchanged for an anion selected from the group consisting of ClO_4, ClO_3, CF_3COO, trifluoromethanesulfonate, bis(trifluoromethanesulfonyl)imide, Br, I, I_3, carboxylic acid, PF_6, AsF_6, BF_4, alkyl sulfonates, sulfonamides, methides, and SbF_6.
11. The electrochemical actuator as described in claim 7, wherein the sulfonic acid is selected from the group consisting of 2-acrylamidopropanesulfonic acid, 2-acrylamido-2-methylpropanesulfonic acid, 2-methacrylamido-2-methylpropanesulfonic acid, 2-acrylamidobutanesulfonic acid, 3-acrylamidobutane-2-sulfonic acid, 3-acrylamido-2,3-dimethylbutane-2-sulfonic acid, 2-acrylamido-2,4,4-trimethylpentanesulfonic acid, 2-acrylamido-2-phenylethanesulfonic acid, 2-acrylamido-2-phenylpropanesulfonic acid, 2-acrylamido-2-tolylethane sulfonic acid, 2-acrylamido-2-pyridylethane sulfonic acid, [3-[(1,1-dimethyl-hydroxyethyl)amino]-2-hydroxypropanesulfonic acid], [3-(cyclohexylamino)-2-hydroxy-1-propanesulfonic acid, 3-[N,N-bis(hydroxyethyl)amino]-2-hydroxypropanesulfonic acid, [N-(2-hydroxyethyl)piperazine-N'-2-hydroxy propanesulfonic acid], 3-(N-morpholino)-2-hydroxypropanesulfonicsulfonic acid, piperazine-N,N'-bis(2-hydroxypropanesulfonic acid), and 3-[N-tris-(hydroxymethyl) methyl amino]-2-hydroxypropanesulfonic acid.
12. The electrochemical device as described in claim 1, wherein the high-conductivity conjugated polymer is formed into a fiber.
13. The electrochemical device as described in claim 1, wherein the high-conductivity conjugated polymer is formed into a film.
14. A method for maintaining the high conductivity of a high-conductivity conjugated polymer for use in an organic electrolyte which comprises the step of exchanging the anion associated with the high-conductivity conjugated polymer with an anion which is soluble in the organic electrolyte.
15. The method for maintaining the high conductivity of a high-conductivity conjugated polymer for use in an organic electrolyte as described in claim 14, wherein the anion associated with the high-conductivity conjugated polymer is

exchanged for an anion selected from the group consisting of ClO_4, ClO_3, CF_3COO, trifluoromethanesulfonate, bis(trifluoromethanesulfonyl)imide, Br, I, I_3, carboxylic acid, PF_6, AsF_6, BF_4, alkyl sulfonates, sulfonamides, methides, and SbF_6.